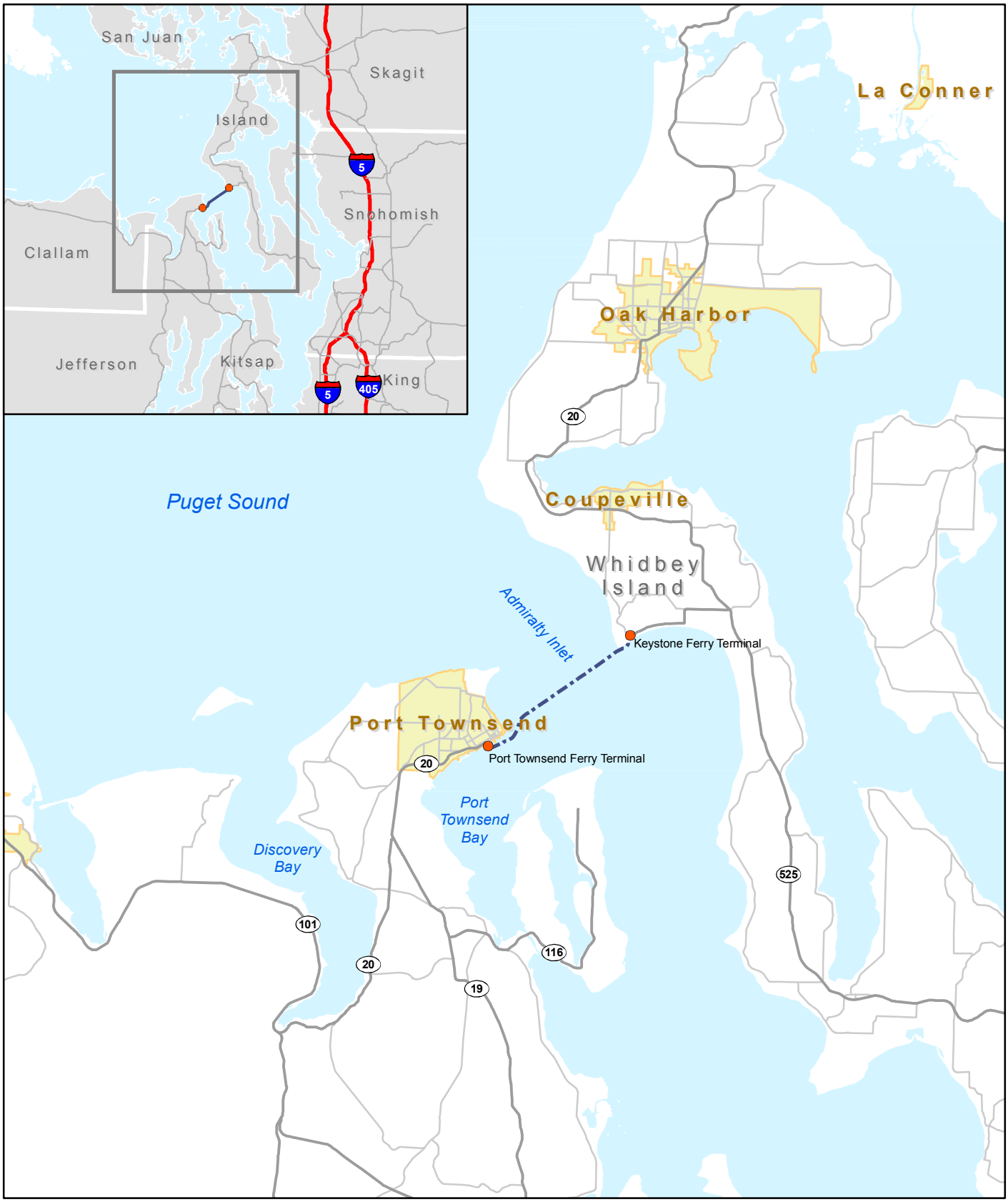

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Ferry Terminal

Ferry Routes

City Limits

N

0 1 2 4 Miles

Figure 2
Vicinity Map

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:

Flat

b. What is the steepest slope on the site (approximate percent slope)?

Upland areas: 2 percent (at the new remote holding area)

Offshore: overall gradient of 3 percent with some areas up to 32 percent

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Surficial Soils

Natural Resource Conservation Services mapped the on-land surficial soil unit within the project study area as “cut and fill” land. These soils are landfills in low, depressional, wet, or swampy areas. Fill consists of a mixture of many types of soil material that are too variable to determine the characteristics and engineering properties. The new remote holding area is mapped as modified land, i.e., soil, sediment, or other geologic material locally reworked by excavation and/or redistribution to modify topography. Many of the surface soils have been modified as the area has developed. Low areas have been raised with fills. These fills range in consistency from high-quality compacted sands and gravels to very loose sands and gravels with layers of sawdust.

The upper 5 feet of sediment in the underwater portion of the project study area include fine sands and silty sands with occasional gravels.

There are no agricultural soils or farmlands on the project site.

Deeper Soils

The upland fill is of variable thickness and is generally underlain by more competent glacial materials. The upper layers are post-glacial and often fine-grained; therefore, they are relatively soft or loose in consistency. These soils generally exhibit low bearing strengths and high compressibility. The groundwater is high all year in most areas, so some of the cohesionless layers in the fine-grained soils may be susceptible to liquefaction (depending on their characteristics). Likewise, the underlying sands and gravels may be liquefiable where they are loose. The dense silts, sands, and gravels underlying the surface layers generally have high bearing strengths, low compressibility, and low liquefaction potential.

Existing geotechnical information suggests that soils in the proposed remote holding location consist of up to 8 feet of very loose gravelly sand or sandy gravel with layers of peat and sawdust, overlying more competent, medium-dense, sandy gravel.

At the ferry terminal, the submerged soils generally consist of an upper layer of loose sands and gravels that thins to the southeast as the water depth gets deeper. The underlying sands, gravels, and some layers of silt are very dense and contain varying amounts of cobbles and boulders. The loose sands and gravels have relatively low strength and are susceptible to liquefaction. The underlying dense sands are opposite in consistency, with high strength and low liquefaction potential.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Steep slopes are present north of the ferry terminal (Figure 3). The slopes are nearly vertical bluffs approximately 30 feet high and are steeper than 1:1 vertical to horizontal. However, these bluffs do not show signs of instability. A combination of glacial overconsolidation and cementation has most likely led to these slopes standing in an oversteepened condition for many years.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Approximately 13,000 cubic yards of soils would be dredged from the harbor if the 124- to 144-car vessel is assigned to the route. The excess dredged material would require off-site disposal. The timing of the dredging, if it occurs, would be associated with the vessel decision after the Keystone Project EIS, which will occur in late 2007 or early 2008.

Excavation and fill areas are shown on Figure 4. Fill soils would be used for the new entrance and exit lanes of the ferry terminal. Some excavated materials may be re-used on-site. Up to 862 cubic yards of soil and aggregates would be imported from a permitted facility.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Surface soils in the study area would be prone to erosion if appropriate best management practices (BMPs) are not implemented during construction. Erosion of surface soils would potentially result from exposed ground surfaces, excavations, earthfill embankments, and stockpiles of earthfill and aggregates.

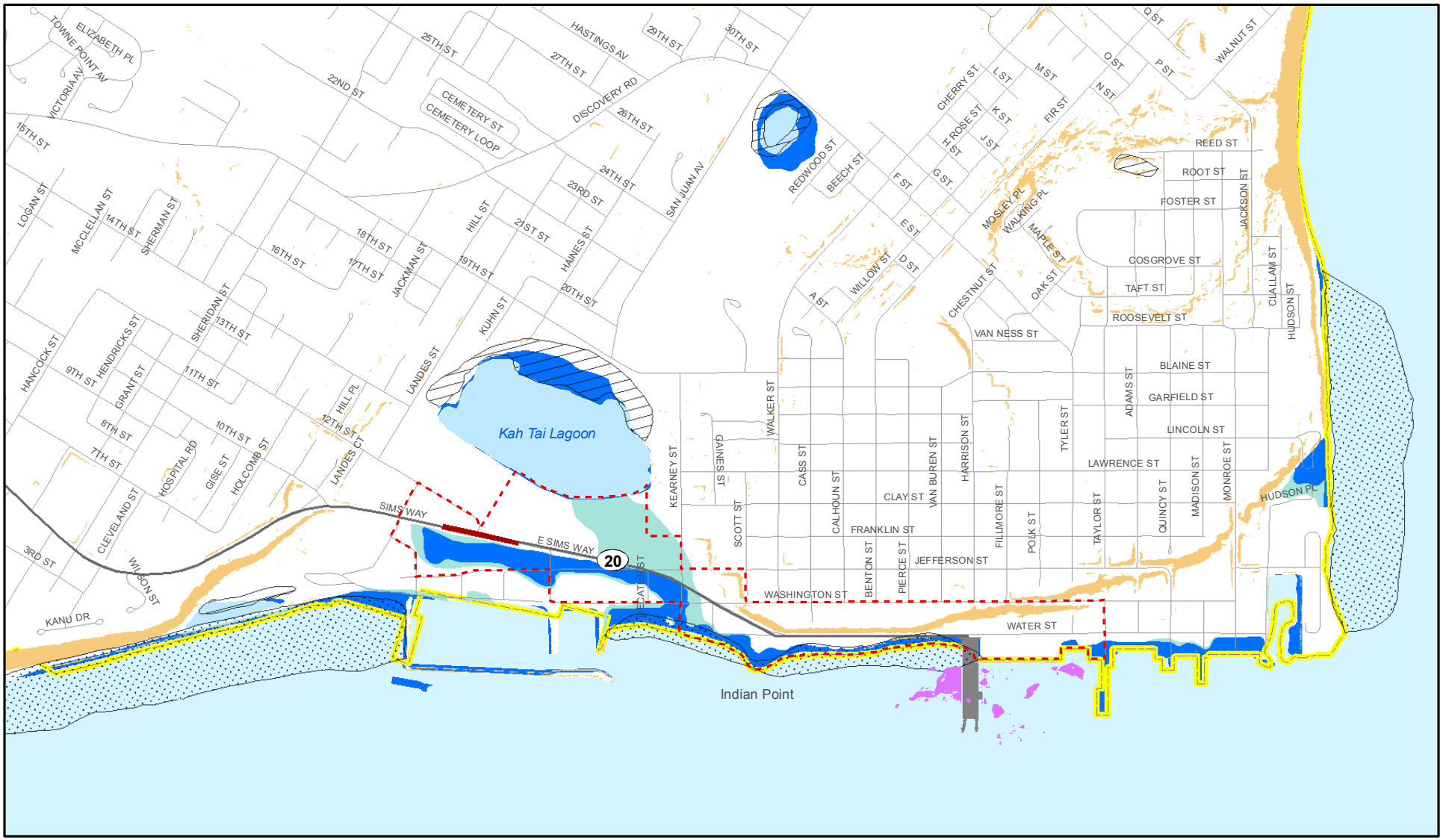
A coastal erosion map indicates that the ferry terminal study area is located in an area of modified shoreline with no appreciable longshore transport or erosion.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Ferry terminal: 93% of the site (2.55 ac on a 2.73-acre site), a net increase of 1.15 ac of impervious area. Total “pollutant-generating impervious surface” is 2.55 acres.

Remote holding area: 50% (0.88 ac on a 1.74-acre site), a net increase of 0.26 ac of impervious area. Total “pollutant-generating impervious surface” is 0.74 acre. The remote holding area would have two lanes; the inner lane would be impervious pavement and the outer lane would be pervious pavement. The new bike path south of the holding area (approximately .1 acre) would be paved with pervious pavement.

The impervious area was calculated electronically using the geographic information system (GIS) for the terminal and remote holding area.



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Source: City of Port Townsend, Washington DNR, NWI.

Slopes 40 to 100 Percent
Eelgrass
100-Year Flood Zone
500-Year Flood Zone
Palustrine Wetlands
Estuarine Wetlands
Ferry Terminal
Remote Holding Area
City Limits
Study Area

N

0 500 1,000 Feet

Figure 3
Critical Areas

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Erosion would be mitigated by good quality control and erosion control methods during construction, as well as diligent maintenance until vegetation or other permanent erosion control features are established. Measures to reduce or avoid impacts to the earth include:

- A temporary pollution control plan would be implemented that sets forth best management practices for erosion control and a monitoring plan to ensure continued mitigation throughout the project. BMPs for erosion would be required in construction documents, including items such as silt fences, straw bales, and sedimentation ponds. An inspection plan that addresses signs of erosion, instability, or settlement of stockpiles would be required.
- Excavated soils may be used for structural fill onsite provided they can be compacted to the City's requirements for structural fill. Most granular soils that are compactable and organic-free can be used as structural fill provided they are near their optimum moisture content. Soils in excess of 5 to 10 percent fines passing the number 200 sieve are moisture-sensitive and may not be suitable for use as structural fill during wet weather. During wet weather, amendments such as adding cement or cement kiln dust can be used to reduce the moisture content in the soils. Excavated soils can also be exported to use at a different site if they do not meet structural fill requirements at the time of construction at this site.
- Minimum standards of practice would be implemented that would protect workers and the public from the effects of seismic loading during construction.
- During preliminary design, Washington State Ferries would conduct a geotechnical investigation of subsurface conditions and would monitor groundwater levels to understand the subsurface conditions prior to final design. Mitigation for long-term settlement and seismic hazards would be identified following this investigation (if needed). Design methods would be used to minimize long-term settlement, such as appropriate subgrade preparation and pavement design and good quality control during construction of earthfills for the roadway. For seismic hazards, current seismic design methods would be used and, if required, soils can be improved to reduce the risk for liquefaction and related seismic damage. Alternatively, the project elements would be selected or designed to either reduce the level of damage from liquefaction or to be repairable if the supporting soils do liquefy or experience permanent displacements.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Dust and internal combustion engine exhaust could be emitted during construction of the project. Fugitive dust may become airborne during demolition, material transport, grading, driving of vehicles and machinery on and off the site, and through wind events. If traffic congestion occurs during construction, motor vehicle emissions could increase in the study area. During paving, organic compounds (VOCs) and odorous compounds could be emitted.